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10/595,357	04/12/2006	Todd R. McNutt	PHUS030413US	7801

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EXAMINER	
NEWMAN, MICHAEL A	

ART UNIT	PAPER NUMBER
2624	

MAIL DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/595,357	MCNUTT ET AL.	
	Examiner	**Art Unit**	
	MICHAEL A. NEWMAN	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 April 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-10 and 12-21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10 and 12-21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *12 April 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *04/12/2006*.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. The preliminary amendment filed on April 12th, 2006 has been entered.

2. In view of the amendment to the claims, the amendment of claims 1 – 4, 7, 9, 10 and 12 – 19, the cancellation of claim 11 and the addition of claims 20 and 21 have been acknowledged.

Claim Objections

3. Claims 1, 3, 4, 12 and 17 are objected to because of the following informalities:

a. Claim 1 recites "selecting a shape model" in line 3. However, in line 4, claim 1 refers to “the model”. Line 1 of claim 3 refers to “the shape model”; line 3 of claims 4 and 12, and lines 4 and 5 of claim 17 refer “the model”; while line 3 of claim 17 refers to "the selected model". Although it appears as though "the model", "the shape model" and "the selected model" are one and the same; Applicant is advised to clarify this by using consistent nomenclature (for example, 'the selected shape model').

Appropriate correction is required.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 1 – 10 and 12 – 19 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

6. Claim 1 recites the limitation "the image data" in line 3. There is insufficient antecedent basis for this limitation in the claim.

7. Claim 17 recites the limitation "the image data" in lines 3 and 4. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. Claims 1 and 14 are rejected under 35 U.S.C. 102(b) as being anticipated by Krause et al. (U.S. Patent No. 6,701,174). Hereinafter referred to as Krause.

a. Regarding claims 1 and 14, Krause teaches a diagnostic imaging system comprising: a means for selecting a shape model of an organ **(Col. 11 lines 14 – 16 and Col. 12 lines 4 – 7)**; a means for best fitting the selected model to the image data **(Col. 12 lines 21 – 29) [Note that the template is initialed by being positioned and scaled so as to resemble the patient's bone]**; and a manual means for modifying selected regions of the model to precisely match the image data **(Col. 12 lines 42 – 46 and Col. 12 line 66 to Col. 13 line 15)**.

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

11. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

12. Claims 2, 3, 12, 13 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Krause et al. (U.S. Patent No. 6,701,174) in view of Newell et al. (U.S. Patent No. 6,911,980). Hereinafter referred to as Krause and Newell respectively.

a. Regarding claims 2 and 3, Krause teaches all the limitations of claim 1, as set forth in the 35 U.S.C. 102 rejection of claim 1 above. Krause also teaches that the shape model is represented by an adaptive mesh including: vertices and links which connect individual vertices **(Krause Col. 12 lines 42 – 53 and Fig. 9A and 9B)**. Furthermore, Krause teaches a free-form deformation process which allows a "user to treat a solid as if it were constructed from a special type of topological putty or clay which may be bent, twisted, tapered, compressed,

expanded, and otherwise transformed... into a final shape." **(Krause Col. 12 line 66 to Col. 13 line 3)**. Krause also teaches the use of a computer mouse to manipulate the 3D models **(Krause Col. 19 lines 41 – 43)**. However, **Krause does not explicitly teach** deforming the mesh such that individual vertices are moved in accordance with a move of a mouse. **Pertaining to the same field of endeavor, Newell teaches a surface manipulation interface allowing a user to select and drag a point on the curve (Newell Col. 2 lines 64 – 67). Specifically, the user will click and drag the mouse from one point to another to trigger a flexible sheet illusion (Newell Col. 3 lines 1 – 8) while causing the vertices to move accordingly (Newell – Fig. 9). In a specifically pertinent embodiment, Newell teaches that when it is useful to produce symmetric or pre-defined distortions, the mouse movement in vertical and horizontal directions can be converted into the magnitudes of such distortions (Newell Col. 6 lines 44 – 66 and Col. 8 lines 11 – 16). <u>Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to enable a user to virtually manipulate the 3D model in Krause, by converting mouse movements directly into distortion parameters, as taught by Newell, in order to provide an easy to learn and natural user interface (Newell Col. 2 lines 64 – 65) in which the 3D model surface vertices can be pulled/pushed by mouse movements and thus resemble a topological putty or clay, as suggested by Krause.</u>**

b. Regarding claim 12, Krause teaches the system as set forth in claim 3, wherein the manual tools include: a pencil tool which deforms an original boundary of the model to align the original boundary with a drawing path defined by a mouse **(Krause Col. 11 lines 19 – 21 and lines 62 – 67)**.

c. Regarding claim 13, Krause teaches the system as set forth in claim 12, wherein the vertices located within a capture range defined by end planes are pulled towards a capture plane which is normal to a motion of the mouse along the drawing path **(Krause Col. 12 lines 5 – 11)**.

d. Regarding claim 16, Krause teaches the system as set forth in claim 1, further including: a means for acquiring the image data representative of at least the organ of a subject **(Krause Col. 9 line 66 to Col. 10 line 1)**.

13. Claims 4 – 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Krause et al. (U.S. Patent No. 6,701,174) and Newell et al. (U.S. Patent No. 6,911,980) as applied to claim 3 above, and further in view of Ohba (U.S. Patent No. 4,885,702). Hereinafter referred to as Krause, Newell and Ohba, respectively.

a. Regarding claims 4, 5, 6, 7, 9 and 10, Krause and Newell teach all the limitations of the dependent claim 3 as set forth in the 35 U.S.C. 103 rejection of claim 3 above. As previously discussed, Newell teaches converting a mouse dragging movement directly into parameters of pre-defined surface distortions. However, **neither Krause or Newell teach** a Gaussian pull tool which deforms a surface of the model by pulling selected vertices along a predefined smooth

curve, wherein the predefined smooth curve is a Gaussian curve, wherein the Gaussian curve is controlled by a radius which defines a width of Gaussian spread and wherein the Gaussian curve is controlled by x- and y-radii, wherein x-radius defines a width of Gaussian spread in a direction of a move of a mouse and y-radius defines a width of Gaussian spread in a direction which is orthogonal to the mouse move. **Pertaining to the same field of endeavor Ohba teaches a surface deformation providing a user interface enabling a user to select from and control the amount of a set of predefined surface distortion functions, and see the results in real time (Ohba Col. 6 lines 56 – 62). Specifically, Ohba teaches the application of a gradual and symmetric Gaussian (or spherical) distribution function to obtain a deformed surface in which the deformation quantity has a maximum value at the center/action point and converges gradually to zero as the displacement from the center increases (Ohba Col. 5 lines 55 – 64 – Fig. 3 & Col. 15 lines 3 – 33 – Fig. 11). Ohba teaches that using a Gaussian distribution deformation results in a soft and natural curved surface (Ohba Col. 8 lines 3 – 6). To apply the deformation, the user uses a mouse to select the action point (or center), two levers to control the x and y-direction diameters and a third lever to control the height of the Gaussian deformation (Ohba Col. 8 lines 22 – 39). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to restrict user manipulations of Krause's models to gradual and**

natural deformations, such as the Gaussian distribution deformations taught by Ohba, by converting mouse movements in the vertical and horizontal directions directly into the distribution's x and y-direction radii, as taught by Newell, so as to replace Ohba's levers (as motivated by Newell in Col. 6 lines 55 – 57), thus providing an intuitive mouse-only user interface while ensuring the resulting 3D models appear natural and realistic.

b. Regarding claim 8, Krause as modified by Newell and Ohba with regards to claim 5 teaches that the Gaussian curve is controlled by a function which smoothly transitions from 1 to 0 **(Ohba Fig. 3 – Col. 5 lines 55 – 65) [Note that the figure and discussion, which teach a Gaussian distribution distortion function which gradually varies from a deformation vector height to zero, are directed to the resulting deformation given by equation 1 (Col. 5). However, it is clear that the controlling function in equation 1 is actually a Gaussian function with unity gain, F_i, multiplied by the vector height, V_i]**.

14. Claims 15 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Krause et al. (U.S. Patent No. 6,701,174) in view of Gauthier (U.S. Pg Pub No. 2004/0012641). Hereinafter referred to as Krause and Gauthier respectively.

a. Regarding claim 15, Krause teaches all the limitations of the independent claim 1, as set forth in the 35 U.S.C. 102 rejection of claim 1 above. Krause teaches that the operator determines which of the patient's anatomical parts is to

be viewed, and further teaches that the operator can manually choose (using a keyboard and a mouse) the contour corresponding to that part **(Krause Col. 11 lines 12 – 15 and lines 62 – 67)**. Krause, however, teaches that the manually selected contour is analyzed to automatically determine which corresponding 3D template bone model to retrieve from the database **(Krause Col. 12 lines 21 – 25)**. Krause **does not teach** a means for dragging and dropping the model on the image data. **Pertaining to the same field of endeavor, Gauthier teaches a three-dimensional image generation system in which a user can select a three-dimensional component from an 'icon area' containing the available components drag and drop it onto a virtual surface for further manipulation (Gauthier PPs 0049 – 0052 and Figs. 7 and 8).** <u>**Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to allow the surgeon/operator, having already determined which of the patient's anatomical parts is being evaluated, to manually select the most representative 3D template model on a database list by quickly dragging and dropping the 3D template model onto the 2D image surface, thus avoiding the computational complexity required to make the automatic determination while providing an intuitive, minimally-cumbersome user interface for the operator.**</u>

b. Regarding claim 17, Krause teaches all the limitations of the independent claim 1, as set forth in the 35 U.S.C. 102 rejection of claim 1 above. Krause further teaches a method of segmenting the image of the diagnostic imaging

system of claim 1, comprising: globally scaling, rotating and translating the model to fit the image data **(Krause Col. 12 lines 21 – 29)**; and deforming local regions of the model with a set of manual tools to match the image data **(Krause Col. 12 lines 42 – 46 and Col. 12 line 66 to Col. 13 line 15)**. Krause, however, teaches that the manually selected contour is analyzed to automatically determine which corresponding 3D template bone model to retrieve from the database **(Krause Col. 12 lines 21 – 25)**. Krause **does not teach** dragging and dropping the selected model on the image data. **Pertaining to the same field of endeavor, Gauthier teaches a three-dimensional image generation system in which a user can select a three-dimensional component from an 'icon area' containing the available components drag and drop it onto a virtual surface for further manipulation (Gauthier PPs 0049 – 0052 and Figs. 7 and 8).** <u>**Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to allow the surgeon/operator, having already determined which of the patient's anatomical parts is being evaluated, to manually select the most representative 3D template model on a database list by quickly dragging and dropping the 3D template model onto the 2D image surface, thus avoiding the computational complexity required to make the automatic determination while providing an intuitive, minimally-cumbersome user interface for the operator.**</u>

15. Claims 18 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Krause et al. (U.S. Patent No. 6,701,174) and Gauthier (U.S. Pg Pub No. 2004/0012641) as applied to claim 17 above, and further in view of Newell et al. (U.S. Patent No. 6,911,980) and Ohba (U.S. Patent No. 4,885,702). Hereinafter referred to as Krause, Gauthier, Newell and Ohba, respectively.

a. Regarding claims 18 and 19, Krause and Gauthier teach all the limitations of the dependent claim 17, as set forth in the 35 U.S.C. 103 rejection of claim 17 above. Krause further teaches that the model is represented by an adaptive mesh which includes vertices and links connecting individual vertices **(Krause Col. 12 lines 42 – 53 and Fig. 9A and 9B)**. Krause also teaches the use of a computer mouse to manipulate the 3D models **(Krause Col. 19 lines 41 – 43)**. However, **Krause does not explicitly teach** that the step of deforming includes: selecting vertices to be deformed; and deforming them in accordance with a move of a mouse. **Pertaining to the same field of endeavor, Newell teaches a surface manipulation interface allowing a user to select and drag a point on the curve (Newell Col. 2 lines 64 – 67). Specifically, the user will click and drag the mouse from one point to another to trigger a flexible sheet illusion (Newell Col. 3 lines 1 – 8) while causing the vertices to move accordingly (Newell – Fig. 9). In a specifically pertinent embodiment, Newell teaches that when it is useful to produce symmetric or pre-defined distortions, the mouse movement in vertical and horizontal directions can be converted into the magnitudes of such distortions (Newell Col. 6 lines**

44 – 66 and Col. 8 lines 11 – 16). **<u>Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to enable a user to virtually manipulate the 3D model in Krause, by converting mouse movements directly into distortion parameters, as taught by Newell, in order to provide an easy to learn and natural user interface (Newell Col. 2 lines 64 – 65) in which the 3D model surface vertices can be pulled/pushed by mouse movements and thus resemble a topological putty or clay, as suggested by Krause.</u>** However, Krause and Newell still **fail to teach** selecting a transformation algorithm to transform the vertices; converting the mouse motion into local deformation parameters; and transforming the selected vertices in the model by the local deformation parameters. **Pertaining to the same field of endeavor Ohba teaches a surface deformation providing a user interface enabling a user to select from and control the amount of a set of predefined surface distortion functions, and see the results in real time (Ohba Col. 6 lines 56 – 62). Specifically, Ohba teaches the application of a gradual and symmetric Gaussian (or spherical) distribution function to obtain a deformed surface in which the deformation quantity has a maximum value at the center/action point and converges gradually to zero as the displacement from the center increases (Ohba Col. 5 lines 55 – 64 – Fig. 3 & Col. 15 lines 3 – 33 – Fig. 11). Ohba teaches that using a Gaussian distribution deformation results in a soft and natural curved surface (Ohba Col. 8 lines 3 – 6). To apply the deformation, the user uses a mouse to**

select the action point (or center), two levers to control the x and y-direction diameters and a third lever to control the height of the Gaussian deformation (Ohba Col. 8 lines 22 – 39). <u>Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to restrict user manipulations of Krause's models to gradual and natural deformations, such as the Gaussian distribution deformations taught by Ohba, by converting mouse movements in the vertical and horizontal directions directly into the distribution's x and y-direction radii, as taught by Newell, so as to replace Ohba's levers (as motivated by Newell in Col. 6 lines 55 – 57), thus providing an intuitive mouse-only user interface while ensuring the resulting 3D models appear natural and realistic.</u>

16. Claims 20 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Krause et al. (U.S. Patent No. 6,701,174) in view of Chaney et al. (U.S. Patent No. 5,926,568). Hereinafter referred to as Krause and Chaney respectively.

a. Regarding claim 20, Krause teaches a method preparing a therapy plan comprising: acquiring image data **(Krause Col. 9 line 66 to Col. 10 line 1)**; automatically segmenting the image data by selecting a best-fit model representative of one or more segmented structures in the image data **(Col. 12 lines 21 – 29) [Note that the template is initialed by being positioned and scaled so as to resemble the patient's bone]**; applying manual shape-altering

tools to the best-fit model such as to modify the model to conform to the image data **(Col. 12 lines 42 – 46 and Col. 12 line 66 to Col. 13 line 15)**. Krause further teaches that the resulting realistic 3D models can assist a surgeon in making detailed surgical plans **(Krause Col. 17 lines 44 – 51)**, and can be useful for determining treatment deviation or progress by comparing saved pre-treatment models with corresponding post-treatment models **(Krause Col. 20 lines 1 – 13)**. However, Krause is mainly concerned with bone treatment and **does not explicitly teach** the use of the 3D models to form a radiation therapy plan. **Pertaining to the same field of endeavor, Chaney teaches an automatic anatomical part recognition system tolerant to shape and image variations (Chaney Col. 3 lines 32 – 35). Not unlike Krause, Chaney first acquires an image of the body organ and selects a shape template model of the particular organ and initializes it by performing global transformations (translation, rotation, scaling) (Chaney Col. 7 line 33 – Col. 8 line 6). Chaney then performs semi-automatic local deformation of the template model to minimize the error (Chaney Col. 8 lines 18 – 36). Chaney teaches a correctly segmented organ model, showing the correct size, shape and location, is useful for physicians practicing radiation therapy by allowing them to carefully direct radiation into the predetermined treatment area while avoiding surrounding tissue (Chaney Col. 1 lines 19 – 46). Furthermore, Chaney teaches that in some cases, X-ray planning images of the affected regions are manually reviewed by the physician to determine**

the most appropriate radiation treatment approach (Chaney Col. 1 line 66 – Col. 2 line 8). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the 3D organ model, obtained by Krause from X-ray images, to accurately measure the dimensions and location of the organ and use them to determine the appropriate radiation therapy beam direction and intensity, as taught by Chaney, to maximize effectiveness while minimizing peripheral tissue radiation damage.

b. Regarding claim 21, Krause, as modified by Chaney, further teaches that the modified model is saved as a potential best-fit model in future radiation therapy plans **(Krause Col. 12 lines 35 – 41)**.

Conclusion

17. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

a. Barr, Alan H.. "Global and local deformations of solid primitives." *ACM SIGGRAPH Computer Graphics* 18:3(1984): 21 - 30. Print.

b. Sederberg, Thomas W., and Scott R. Parry. "Free-form deformation of solid geometric models." *ACM SIGGRAPH Computer Graphics* 20:4(1986): 151 - 160. Print.

c. Coquillart, Sabine. "Extended free-form deformation: a sculpturing tool for 3D geometric modeling." *Proceedings of the 17th annual conference on Computer graphics and interactive techniques* 24:4(1990): 187 - 196. Print.

d. Kaus et al. (U.S. Pg Pub No. 2003/0020714) teaches a three-dimensional object segmenting method.

e. Zahalka et al. (U.S. Patent No. 6,385,332) teaches an automated segmentation method for 3D ultrasound images using geometrically deformable models.

f. Sheehan et al. (U.S. Patent No. 6,106,466) teaches an automated hear-contour delineation method.

g. Sheehan et al. (U.S. Patent No. 5,889,524) teaches using piecewise smooth subdivision surface (mesh) to represent a three-dimensional object and the need to constrain mesh perturbations to round shapes.

h. Joshi et al. (U.S. Patent No. 7,200,251) teaches a 3D model creation and deformation system in which the user selects boundary points and modifies the model using points along the medial axis.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHAEL A. NEWMAN whose telephone number is (571) 270-3016. The examiner can normally be reached on Mon - Thurs from 9:30am to 6:30pm (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew C. Bella can be reached on (571) 272-7778. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Matthew C Bella/
Supervisory Patent Examiner, Art Unit 2624

M.A.N.